

National Transportation Safety Board

Office of Aviation Safety

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AIRWORTHINESS FACTUAL REPORT- ON-SCENE

February 4, 2026

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A. ACCIDENT

Location: Philadelphia, Pennsylvania
Date: January 31, 2025
Time: 1807 eastern standard time
Airplane: Learjet 55, registration XA-UCI

B. AIRWORTHINESS FACTUAL REPORT- ON-SCENE

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C. SUMMARY

On January 31, 2025, at 1807 eastern standard time, a Learjet 55, XA-UCI, was destroyed when it was involved in an accident near Philadelphia, Pennsylvania. The airline transport pilot, commercial pilot, 2 flight medical staff, 2 passengers, and 1 person on the ground were fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 135 air ambulance flight.

D. DETAILS OF THE EXAMINATION

1.0 Accident Site

The wreckage debris field was located between the intersections of Hanford St. at Cottman Ave. and Roosevelt Blvd. and Cottman Ave which spanned about 1410

ft. The airplane horizontal stabilizer contacted a business sign beside the main impact crater. White paint transfer was evident at the point of contact with the sign. From the point of contact with the sign to the impact crater measured at an angle of 22°. From

the initial impact crater, the airplane debris fanned outwards, following a heading of about 150°.

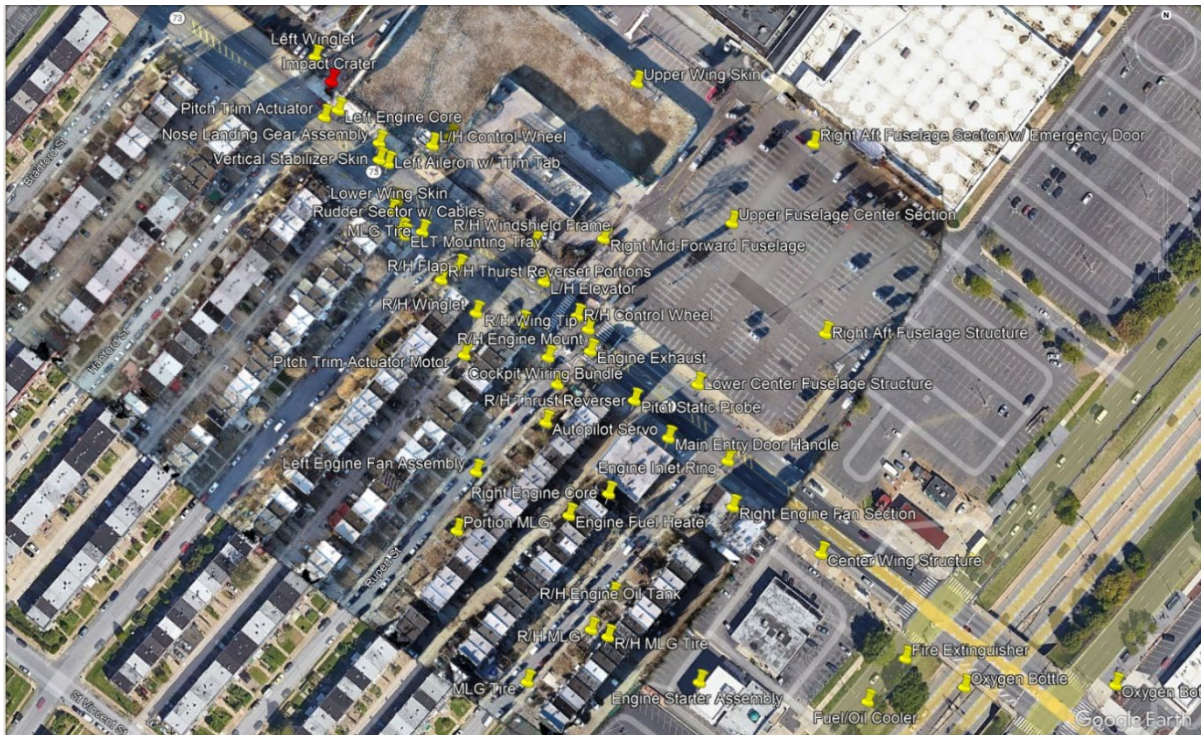


Figure 1: Key Debris

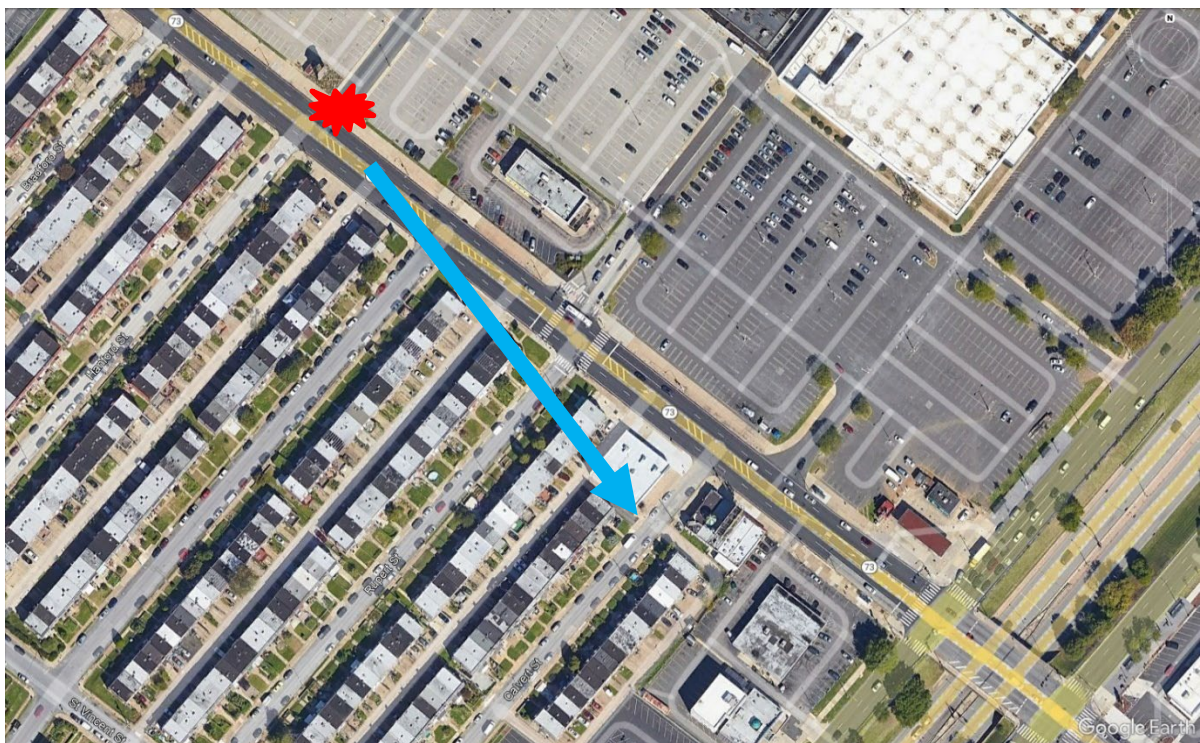


Figure 2: Impact Crater and Main Debris Heading

Several medical oxygen bottles were located outside of the main debris field, on the opposite side of Roosevelt Blvd. Multiple cars on Cottman Ave. were burned or severely damaged. Several residential structures on the southern side of Cottman Ave. were damaged or destroyed by fire and impact with airplane debris. A Dunkin restaurant was damaged as a result of debris impacting the structure.

The initial impact crater, measuring about 8 ft deep and 10 ft in diameter, was located along Cottman Ave., on the northeast sidewalk, between Roosevelt Blvd. and Bustleton Ave. The sidewalk was forced up approximately three feet around the impact crater.

2.0 Airframe Examination

Three investigators from Bombardier and two investigators from Honeywell were present for the on-scene examination of the airplane. The airplane key components were documented via GPS coordinates and plotted onto drone imagery provided by the NTSB Drone support team. The airplane was destroyed during the impact sequence. Photographs of most of the listed components can be found in Appendix A of this document.

Moving away from the crater, southeast along Cottman Avenue, the following components were identified in order of distance from the crater:

- one engine
- pitch trim actuator; the actuator was still attached to aircraft structure at both ends (Appendix A Figure 2)
- a portion of the nose landing gear strut and the nose landing gear tire, wedged under the front of a car (Appendix A Figure 3)
- portions of lower wing skin
- what appeared to be a portion of the top of the vertical stabilizer where the HF antenna connects
- what appeared to be a portion of the left-hand aileron with the trim tab and trim tab actuator still attached (Appendix A Figure 4)
- outboard portion of the left-hand elevator (Appendix A Figure 5)
- a portion of bottom fuselage skin with radar antennae visible
- a portion of outboard main landing gear door
- a small part and a large part of the left-hand flap (Appendix A Figure 6 and Figure 7)
- upper portion of right-hand main landing gear fitting, P/N 2441011-28 (Appendix A Figure 8)
- ELT mounting tray Rudder sector with portions of rudder cables (Appendix A Figure 9)
- Main landing gear wheel and tire assembly, S/N DEC84340

- Right-hand elevator with elevator control horn still attached (Appendix A Figure 10)
- Right-hand flap (Appendix A Figure 11)
- Cockpit circuit breaker panel
- Inboard section of left-hand elevator with elevator control horn still attached (Appendix A Figure 10)
- Top of the vertical stabilizer
- Right-hand wing upper wing skin with right-hand spoiler attached (Appendix A Figure 11)
- Right-hand wing tip (Appendix A Figure 12)
- Section of right-hand forward fuselage with windshield surround structure, with side window heated damaged but intact
- Engine exhaust
- Co-pilot side control wheel (Appendix A Figure 13)
- Lower portion of control column
- Portion of tailcone skin
- A section of center fuselage structure, normally located just above the center wing box
- Pitot probe
- A portion of the center post section of the windshields
- Main entry door handle
- Engine inlet ring
- Portion of center wing structure
- Door dampener assembly for upper entry door

In the field around Dunkin Donuts:

- Portions of upper wing skin (Appendix A Figure 16)
- Pilot control wheel (Appendix A Figure 14)
- Portion of horizontal stabilizer leading edge (Appendix A Figure 15)

In the parking lot of the Macy's department store, the following items were identified:

- A section of right-hand aft fuselage, including emergency egress door (Appendix A Figure 14)
- Various pieces of fuselage structure
- A section of overhead fuselage structure with wiring conduit, from just aft of the pressure bulkhead
- A piece of the aft pressure bulkhead
- SPPR adapter
- Fuselage structure from just aft of the emergency egress door, part of the pressurized baggage

On Roosevelt boulevard, the following items were identified:

- Hydraulic 4-way selector valve

On Calvert street, the following items were identified:

- Engine oil tank
- Right-hand main landing gear strut piston, axle, brake assemblies and portions of wheels (Appendix A Figure 17)
- Main landing gear tire

On Rupert street, the following items were identified:

- Portion of cockpit with wiring and pitot tube mount
- Engine cowling with part of thrust reverser and switch
- Right-hand forward engine mount (Appendix A Figure 18)
- Altimeter
- Portion of cockpit seat structure
- Portion of right-hand thrust reverser assembly (Appendix A Figure 18)
- Attitude direction indicator (ADI)
- Single Point Pressure Refueling (SPPR) door and fuselage skin
- Portion of autopilot servo
- Portion of main wheel (S/N AUG86-2789) and brake assembly
- Engine fire bottle
- Parts of brake assembly
- Engine fan assembly and planetary gear
- Portion of main wheel, S/N JUL84-239, S/N JUL10-3974

Alley between Rupert street and Leonard street:

- Portion of control column
- Portion of right-hand horizontal stabilizer (Appendix A Figure 20)
- Portion of right-hand forward fuselage
- Right-hand winglet (Appendix A Figure 21)
- EGPWS (Appendix A Figure 22)
- Engine fire bottle
- pitch trim actuator motor (Appendix A Figure 23)

On Leonard street, the following items were identified:

- Ram air duct
- Portion of right-hand lower engine cowling
- Right-hand thrust reverser and aft cowl, S/N 5154
- Portion of cabin floorboard structure with portion of wing structure
- Top piece of nose landing gear strut (Appendix A Figure 26)
- Aircraft oxygen bottle
- Main landing gear actuator, likely right-hand (Appendix A Figure 27)
- Portion of aileron control cable
- Fuel boost pump with portion of throttle control cable

- Pieces of engine fan blades
- Portion of main landing gear actuator attachment point
- Nose wheel steering servo (Appendix A Figure 28)

Alley between Leonard street and Hanford street:

- Pillar assembly, main landing gear actuator
- Main landing gear outboard and inboard door
- Portion of flap interconnect cable
- Portions of wing structure
- Main landing gear inboard door

Wreckage retrieved from impact crater

The following items were retrieved from the impact crater:

- Cockpit voice recorder
- Portion of left-hand thrust reverser assembly (Appendix A Figure 1), S/N 5015; one of the thrust reversers racks was in the recovered assembly; the other rack was found separately, but also in the crater (Appendix A Figure 2); this rack appeared to have witness marks on it (Appendix A Figure 32)
- Portion of aft fuselage below tailcone access door with drag chute anchor
- Portion of vertical stabilizer structure
- Portion of vertical stabilizer with elevator up/down spring
- Generator control panel (located in aft equipment bay)
- Faceplates for engine EECs
- Portion of rudder with trim tab, trim tab control rod still connected at both ends (Appendix A Figure 32)
- Engine fuel control assembly
- Autopilot roll servo
- Engine oil reservoir
- Air conditioning motor
- Left main landing gear fitting, piston, pieces of strut with actuator attachment point (Appendix A Figure 34)
- Autopilot servo, either pitch or yaw
- Air conditioning compressor
- Drag chute, still packed (not deployed) (Appendix A Figure 33)
- Motive flow shutoff valve
- Generator
- Portion of keel beam (Appendix A Figure 36)
- Freon heat exchanger
- Flap track
- GNS-500 internal loop antenna
- Ram air heat exchanger

- Section of main entry door frame with pins and receptacles (Appendix A Figure 37)
- Underwater Locator Beacon (ULB)
- Piece of flap sector with portion of flap cable (Appendix A Figure 38)
- Aileron hinge access panel

3.0 Engine Examination

Both engines were separated from the empennage and located within the debris field. Due to impact damage, it was not possible to identify left or right engine position initially. Four major sections of engine hardware were located within the debris field. Photographs related to the engines can be found in Appendix B of this document. Note that both engines' were initially mislabeled during the on-scene photographs and were later identified by part numbers and serial numbers found on physical parts compared to the maintenance entries.

- One engine core located approximately 30ft from impact crater (labeled as Right in photos). - Identified in notes as engine core 1.
- One engine core located approximately 665ft from the impact crater in a second-floor bedroom (labeled as Left in photos). - Identified in notes as engine core 2.
- One fan assembly was located approximately 560ft from the impact crater under a car on Rupert St. (labeled as Right in photos). - Identified in notes as fan assembly 1.
- One fan assembly was located approximately 785ft from the impact crater at the base overhead billboard on top of Mattress Firm store (labeled as Left in photos). - Identified in notes as fan assembly 2.

It was later determined that the engine that was located 30ft from impact crater was the left engine, and the right engine was located in the bedroom closet.

Numerous pieces of miscellaneous engine hardware were located throughout the debris field.

Engine core 1, TFE731-3 (Left Engine):

- For photo documentation purpose the engine was labeled "Right" (Appendix B Figures 39 and 40)
- The fan assembly and planetary gear system were not attached to the engine.
- Some soot adhered to the compressor section of the engine. There was no soot present on the aft section of the engine
- The LPC case was missing, exposing the first, second, third, and fourth stage rotors. No stator assemblies were present with the core (Appendix B Figure 41).
- Majority of blades were missing from first, second, third, and fourth stage compressors with a few blades missing above the platform.
- Portions of LPC bleed pop valves were present

- Significant asymmetric crushing of the HPC case and Combustor Plenum.
- Combustor case was fractured at approximately 3 o'clock position from the forward split to aft split line exposing a portion of the front side of the diffuser and exposing deswirl blades. The visible deswirl blades were all bent flat (Appendix B Figure 42).
- Fuel manifolds were present but broken at multiple fuel nozzles.
- Major crushing was approximate 8 o'clock position from top dead center mark for top aft engine mount.
- T-duct was fractured at approximately 2 o'clock position and 8 o'clock position.
- Aft engine mount at 3 o'clock position the mount bolt hole was torn outward (Appendix B Figure 43).
- Core exhaust nozzle was crushed.
- After removal of core exhaust nozzle, the second and third stage Low Pressure Turbine (LPT) rotors were present with varying degrees of damage to rotor blades (Appendix B Figure 44).
- Second stage stator present with blade trailing edge tearing.
- Third stage rotor blades were bent opposite direction of rotation (Appendix B Figure 45).
- All Low Pressure shaft rotating components were all decoupled, rotating independent of each other.
- First stage rotor rear curvic was damaged.
- Hardware missing from the engine included: transfer gearbox, accessory gearbox, forward out bypass ducts, fuel control, oil pump, fuel pump,

Engine core 2, TFE731-3 (Right Engine):

- For photo documentation purpose the engine was labeled "Left".
- Engine was found in a vertical position, nose down on the second floor of a residential property (Appendix B Figure 46).
- Engine was covered with soot from fire damage (Appendix B Figure 47).
- Fan assembly was missing from the core.
- LPC case was missing from the third stage stator forward, exposing the 1st, 2nd, and 3rd stage compressor rotors (Appendix B Figure 48).
- Approximately half of the first stage rotor blades were present with bending opposite direction of rotation. Blades were also bent forward.
- Uncoupled curvics were present between first and second stage LPC rotors and were intact
- Second stage rotor was present. Some second stage rotor blades were present with varying degrees of damage.
- Third stage rotor was present.
- Some third stage rotor blades were present with varying degrees of damage.
- Fourth stage rotor was partially visible. The visible portion had blades bent opposite direction of rotation.

- Remaining LPC case aft of third stage was bent and torn with varying degrees of damage.
- The remaining LPC case had compression damage.
- The HPC case had compression damage and was covered in soot.
- Portions of both LPC surge bleed valves were still attached.
- Aft flange of HPC case was separated from combustor plenum for approximately 180°.
- Inward crushing on HPC case and combustor case at approximately the same circumferential position.
- Combustor case had multiple tears. Combustor case tear near forward flange exposed forward portion of centrifugal compressor diffuser (Appendix B Figure 49).
- Fuel manifold was present but had fire damage and was broken in multiple locations.
- T-duct was fractured but attached to combustor plenum.
- Rear bearing support housing was displaced aft from flange of T-duct and is loosely attached to engine, exposing second and third LPT rotors (Appendix B Figure 50).
- Third stage blades were fractured with varying degrees of damage. Indications of rotational bending opposite direction of rotation.
- Second stage turbine rotor had majority of blades missing. Remaining second stage turbine blades were damaged and fractured at either mid-span or at the blade platform.
- First stage LPT blades were visible through second stage LPT blades.
- All Low Pressure shaft rotating components were all decoupled, rotating independent of each other.
- Hardware missing from the engine included: transfer gearbox, accessory gearbox, forward out bypass ducts, fuel control, oil pump, fuel pump,

Fan Assembly 1 (Left Fan Assembly):

- Identified in photos as "Right".
- Fan assembly found under car (Appendix B Figure 51).
- Fan spinner not present with the fan assembly.
- Planetary gear assembly is present.
- Crushing damage to aft side of planetary gears (Appendix B Figure 52).
- Oil system for planetary gears is mostly missing with remaining portion exhibiting crushing damage.
- Fan shaft had sheared.
- Approximately 180° of the inner flow path section of front main frame was present. Struts have been sheared off at inner flow path.
- Aft flange was missing.
- Clockwise forward looking aft

- One blade missing from mid-span damper outboard with bending and tears on leading edge.
- Second blade was intact from hub to tip with rotational bending opposite direction of rotation. Blade had leading edge tears in the tip region.
- Third blade was complete blade with bending opposite direction rotation with leading edge tears near the tip, and trailing edge damage. Blade was displaced aft.
- Fourth blade was complete with minor rotational bending and several leading edge tears at the mid span to the tip. Trailing edge had bending. Blade was displaced aft.
- Fifth blade was complete with tears on the leading edge and bending at the mid span damper
- Continuing clockwise, forward looking aft, there were nine additional blades that were fractured just above the platform.
- Fan disk had non-uniform impact damage to the inner flow path portion between the dovetails. Aft section of inner flow path surface had varying degrees of damage with some areas bent in and some bent out (Appendix B Figures 53, 54, 55, and 56).
- Fifty percent of the compressor inlet stator ring assembly was present with most stators absent. Remaining stators had non-uniform bending.

Fan Assembly 2 (Right Fan Assembly):

- Identified in photos as "Left" (Appendix B Figure 57).
- Fan assembly separated from engine at aft front frame flange.
- Forward looking after (FLA) from the clockwise direction from the one mostly full-length blade there were 10 blades that were fractured at the platforms. All other blades were missing from the fan assembly (Appendix B Figure 58).
- For the one mostly full-length blade, there was rotational bending and significant fractures on the leading edge.
- One missing dovetail, one dovetail bent back beside the missing location.
- Spinner was not present.
- Impact damage on aft face of planetary gears (Appendix B Figure 59).
- Inner flow path aft face had rotational scaring over 270°.
- Approximately eighty percent of the aft front frame flange was present. The bolts were sheared.
- The remaining twenty percent of the flange was missing. Localized impact nicks on the aft side of four of the five main struts. The fifth main strut was fractured.

Other Items

Electronic Engine Controls (EEC)

- Only the front face plate of both EECs were recovered with some wiring. The internals and case were not recovered (Appendix B Figure 60).

Part of a detached fuel control (Appendix B Figure 61).

- PLA window shattered. Indicator visible.
- Dial was displaced from its proper position and cocked (Appendix B Figure 62).
- Indicator was beyond 120 at the end of the gauge.

A portion of a fuel pump was recovered from the crater.

4.0 Appendix A (Airframe Photos)



Figure 1: Left Winglet



Figure 2: Pitch Trim Actuator



Figure 3: Nose Landing Gear Strut



Figure 4: Left-hand Aileron



Figure 5: Portion of Left-hand Elevator



Figure 6: Small Portion of Left-hand Flap



Figure 1: Large portion of Left-hand Flap



Figure 2: Right-hand Main Landing Gear Fitting



Figure 3: Rudder Sector



Figure 4: Right-hand Elevator



Figure 11: Right-hand Flap



Figure 12: Inboard Portion of Left-hand Elevator



Figure 13: Right-hand Upper Wing Skin with Spoiler



Figure 14: Right-hand Wing Tip



Figure 15: Co-pilot Control Wheel



Figure 16: Upper Wing Skin



Figure 17: Pilot Control Wheel



Figure 18: Portion of Horizontal Stabilizer Leading Edge



Figure 19: Emergency Egress Door



Figure 20: Right-hand Main Landing Gear Strut Piston



Figure 21: Right-hand Engine Mount



Figure 22: Portion of Right-hand Thrust Reverser



Figure 23: Portion of Right-hand Horizontal Stabilizer



Figure 24: Right-hand Winglet



Figure 25: EGPWS



Figure 26: Pitch Trim Actuator Motor



Figure 27: Top Piece of Nose Landing Gear Strut



Figure 28: Main Landing Gear Actuator



Figure 29: Nose Wheel Steering Servo



Figure 30: Thrust Reverser Assembly Recovered from Crater



Figure 31: Thrust Reverser Rack Found in Crater



Figure 32: Possible Witness Marks on Thrust Reverser Rack



Figure 33: Rudder



Figure 34: Left-hand Main Landing Gear



Figure 35: Drag Chute



Figure 36: Keel Beam



Figure 37: Main Entry Door Frame

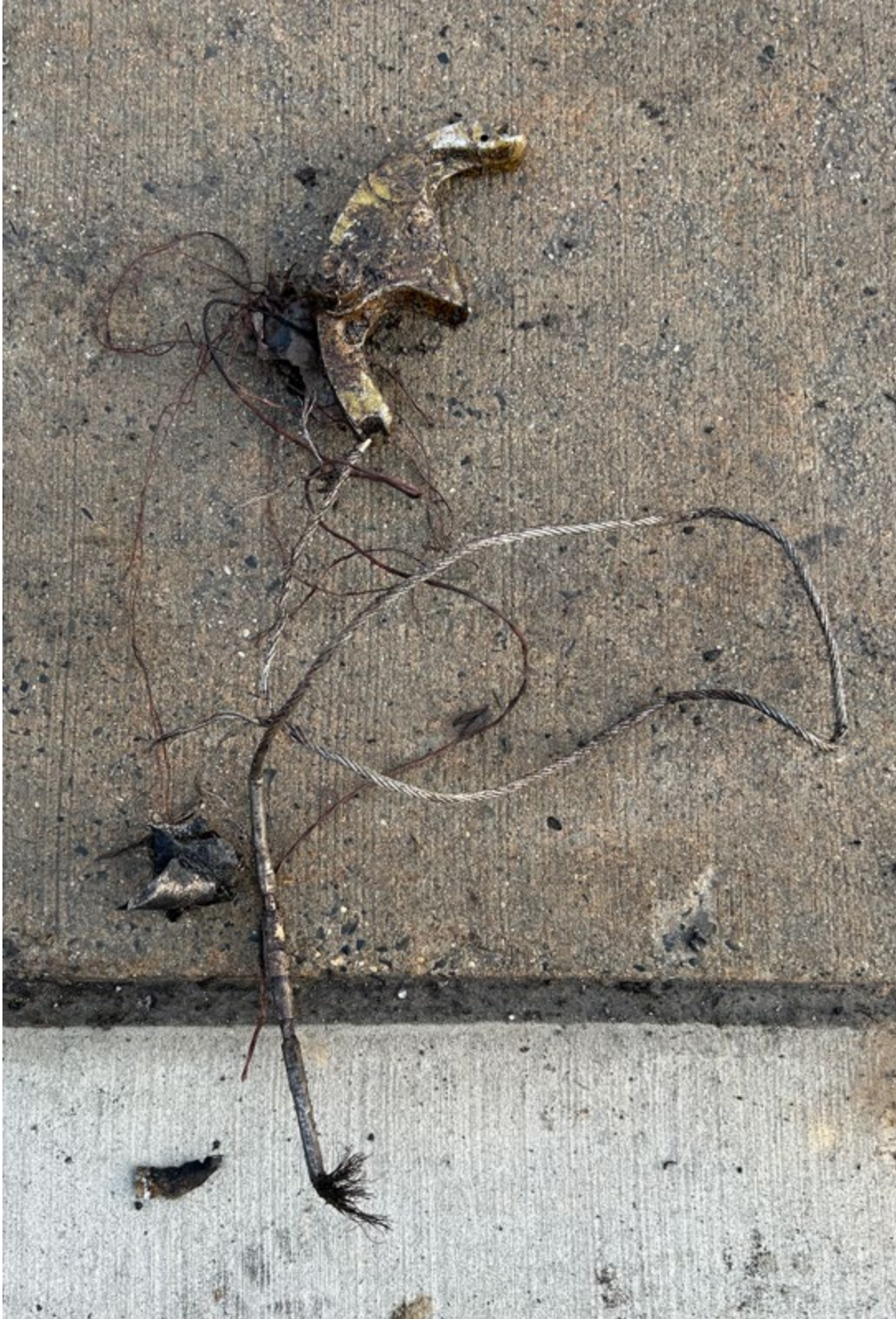


Figure 38: Flap Sector

5.0 Appendix B (Engine Examination Photos)

*Note that both engines were initially mislabeled during the on-scene photographs and were later identified by part numbers and serial numbers found on physical parts compared to the maintenance entries.



Figure 39: Engine Core 1 Near the Impact Crater and Later Identified as the Left Engine (Courtesy of Honeywell)



Figure 40: Engine Core 1 Near the Impact Crater and Later Identified as the Left Engine (Courtesy of Honeywell)



Figure 41: Engine Core 1 Compressor Section (Courtesy of Honeywell)



Figure 42: Engine Core 1 Fractured Plenum and T-Duct (Courtesy of Honeywell)



Figure 43: Engine Core 1 3 O'Clock Aft Engine Mount Bolt Hole Torn Outward (Courtesy of Honeywell)



Figure 44: Engine Core 1 Third Stage LPT with View of Second Stage LPT (Courtesy of Honeywell)



Figure 45: Engine Core 1 Third Stage LPT Blades with Rotational Bending Opposite Direction of Rotation (Courtesy of Honeywell)



Figure 46: Engine Core 2 In the Resident Structure and Later Identified as the Right Engine (Courtesy of Honeywell)



Figure 47: Engine Core 2 - Right Engine (Courtesy of Honeywell)



Figure 48: Engine Core 2 Compressor Section (Courtesy of Honeywell)



Figure 49: Engine Core 2 Compressor Plenum and Exposed Diffuser and Combustor Liner (Courtesy of Honeywell)



Figure 50: Engine Core 2 LPT Section and Displaced Rear Bearing Support Housing (Courtesy of Honeywell)



Figure 51: Fan Assembly 1 Located on Rupert St. (Courtesy of Honeywell)



Figure 52: Fan Assembly 1 Located on Rupert St. (Courtesy of Honeywell)



Figure 53: Fan Assembly 1 Side View of Disk and Blade (Courtesy of Honeywell)



Figure 54: Fan Assembly 1 Side View of Damaged Disk (Courtesy of Honeywell)



Figure 55: Fan Assembly 1 Damaged Disk and Portion of Compressor Inlet Stator Ring (Courtesy of Honeywell)



Figure 56: Fan Assembly 1 Side View of Blades and Some Stator Vanes (Courtesy of Honeywell)



Figure 57: Fan Assembly 2 on Roof of Commercial Building (Courtesy of Honeywell)



Figure 58: Fan Assembly 2 (Courtesy of Honeywell)



Figure 59: Fan Assembly 2 (Courtesy of Honeywell)



Figure 60: Remains of Engine EEC's (Courtesy of Honeywell)



Figure 61: A Portion of an Engine Fuel Control (Courtesy of Honeywell)



Figure 62: A PLA Indicator and Dial Indicator (Courtesy of Honeywell)

Submitted by:

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